

WHAT IS CLAIMED IS:

1. A method for medical ultrasound imaging, comprising:
acquiring ultrasound image data representative of three-dimensional volume
5 segments of an image volume in synchronism with cardiac cycles of a subject, each of
the volume segments containing image data distributed in three dimensions which is
acquired during a cardiac cycle of the subject;
acquiring ECG waveforms of the cardiac cycles during which the volume
segments are acquired;
10 combining the image data representative of the volume segments to provide
image data representative of a three-dimensional ultrasound image of the image
volume; and
displaying the ECG waveforms in a comparative display in which the
uniformity of the waveforms is illustrated.
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2. The method of Claim 1, further comprising displaying the three-
dimensional ultrasound image of the image volume concurrently with the comparative
display of ECG waveforms.
- 20 3. The method of Claim 1, wherein displaying the ECG waveforms in a
comparative display comprises displaying the ECG waveforms in separate lines in
which the waveforms are vertically aligned by their R-waves.
4. The method of Claim 3, wherein displaying the ECG waveforms in a
25 comparative display further comprises displaying the ECG waveforms in different
visually distinctive ways.
5. The method of Claim 4, wherein displaying the ECG waveforms in
different visually distinctive ways comprises displaying the ECG waveforms in
30 different shadings.

6. The method of Claim 4, wherein displaying the ECG waveforms in different visually distinctive ways comprises displaying the ECG waveforms in different colors.

5 7. The method of Claim 1, wherein displaying the ECG waveforms in a comparative display comprises displaying the ECG waveforms in overlapping alignment.

8. The method of Claim , wherein displaying the ECG waveforms in a
10 comparative display further comprises displaying the ECG waveforms in different colors.

9. A method for medical ultrasound imaging, comprising:
acquiring ultrasound image data representative of three-dimensional volume
15 segments of an image volume in synchronism with cardiac cycles of a subject, each of the volume segments containing image data distributed in three dimensions which is acquired during a cardiac cycle of the subject;
acquiring ECG waveforms of the cardiac cycles during which the volume segments are acquired;
20 comparing the ECG waveforms;
reacquiring the ultrasound image data of a volume segment having an ECG waveform which is dissimilar from the ECG waveforms of other volume segments;
combining the image data representative of the volume segments to provide image data representative of a three-dimensional ultrasound image of the image
25 volume; and
displaying a three-dimensional ultrasound image of the image volume.

10. A method for medical ultrasound imaging, comprising:
acquiring ultrasound image data representative of three-dimensional volume
30 segments of an image volume in synchronism with cardiac cycles of a subject, each of the volume segments containing image data distributed in three dimensions which is acquired during a cardiac cycle of the subject;

acquiring ECG waveforms of the cardiac cycles during which the volume segments are acquired;

combining the image data representative of the volume segments to provide image data representative of a three-dimensional ultrasound image of the image

5 volume;

comparing the ECG waveforms;

replacing the ultrasound image data of a volume segment having an ECG waveform which is dissimilar from the ECG waveforms of other volume segments; and

displaying a three-dimensional ultrasound image of the image volume.

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11. A medical diagnostic ultrasound imaging system comprising:

a transducer comprising an array of transducer elements (14);

a transmitter (10) for transmitting ultrasound energy with said transducer (14) into volume segments of an image volume of interest in a subject as a plurality of

15 transmit beams;

a receiver (16) for receiving ultrasound echoes with said transducer (14) from the image volume in response to the ultrasound energy and for generating received signals representative of the received ultrasound echoes;

a receive beamformer (20) for processing said received signals to form at least one receive beam for each of the transmit beams and to generate image data representative of the ultrasound echoes in the receive beam;

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an image memory (30) which stores the image data of a plurality of volume segments;

an ECG device (34) coupled to the subject for generating an ECG signal representative of the cardiac cycle during reception of echoes from a volume segment; and

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a display (46) for displaying an image volume and the ECG signals of the volume segments of the image volume in a comparative display.

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12. The medical diagnostic ultrasound imaging system of Claim 11, wherein the display (46) further comprises a display of the ECG signals of the volume segments which are in vertical alignment.

13. The medical diagnostic ultrasound imaging system of Claim 12, wherein the display (46) further comprises a display of the ECG signals of the volume segments which are vertically aligned by their R-waves.

5 14. The medical diagnostic ultrasound imaging system of Claim 11, wherein the display (46) further comprises a display of the ECG signals of the volume segments in different colors.

10 15. The medical diagnostic ultrasound imaging system of Claim 12, wherein the display (46) further comprises a display of the ECG signals of the volume segments in different colors.

15 16. The medical diagnostic ultrasound imaging system of Claim 11, wherein the display (46) further comprises a display of the ECG signals of the volume segments in overlapping alignment.

20 17. The medical diagnostic ultrasound imaging system of Claim 16, wherein the display (46) further comprises a display of the ECG signals of the volume segments in different colors.